

FEBRUARY 20.

The President, Dr. LEIDY, in the chair.

Forty-nine persons present.

The death of B. Howard Rand, M. D., a member, was announced.

*Notes on Prehistoric Copper Implements.*—Mr. H. T. CRESSON made some remarks upon a hammer of native copper found in the Bohemian Mine, at Greenland, Michigan, in 1866, by Mr. S. F. Peck, and now in the Academy's collection. It exhibits a distinct laminar surface, caused by hammering pieces of native copper together while in a cold state, a process in which our aborigines living in districts north of Mexico, seemed to have acquired great proficiency. This is shown by the numerous wedges, chisels, hammers, and other articles found in the ancient mining-pits at Keewenaw Point, Lake Superior, and at Isle Royal, together with axes, spear- and arrow-points, ornaments, etc., in Ohio, and throughout those sections of our country which at one time were inhabited by the mound-builders, a race of people whose remains indicate a state of advancement in the arts and manufactures superior to the savage nations who succeeded them. It is a very interesting fact, that recent discoveries have shown upon various forms of copper implements, deposited in their burial places by the mound-builders—markings similar to those left by moulds in the process of casting. It may, therefore, be supposed that these people were acquainted with the art of smelting, besides that of hammering copper. Professor Foster in his "Prehistoric Races of the United States," mentions the fact, that in a collection made by Mr. Perkins, he saw copper implements of mound origin, that bear well-defined traces of the mould. . . . "It is impossible," he adds, "to infer after a careful examination of these specimens, that the ridges have been left in the process of hammering or oxidation." . . . "The more I examine their arts and manufactures the stronger becomes my conviction that they were something more than a race of barbarian people." From these observations of Professor Foster, a skillful and cautious observer, it would appear that two processes were used, not only of hammering, but that of smelting, which latter process was in all probability suggested by their supposed method of extracting the masses of copper from their pits—remains of which may still be seen in the Lake Superior copper regions before mentioned. Some of these pits have been explored by Colonel Whittlesey, an account of which was published in the "Smithsonian Contributions to Knowledge for 1863." They were found to contain, in all cases, among the debris, fragments of charcoal and ashes, with traces of fires against the sides thereof, indicating the use of heat in the process of extracting their ores, thereby aiding the wedges and copper chisels which were driven in by means of stone mauls until

the desired pieces were detached. It may, therefore, be probable from the fact, that the melting point of copper is about  $1000^{\circ}$  C. to  $1398^{\circ}$ , there was sufficient heat generated by fires, used in above-mentioned method, to smelt the small points of copper attached to the larger masses, and that these people possessing the intelligence and quick perception of the Indian races, were led to notice and utilize it in smelting copper and casting their work. The artistic forms and finish of their copper implements, whether cast or hammered, cannot fail to impress the observer that a race of men existed in the early history of our continent, whose origin is enveloped in mystery, and whose skill rivals man of historic times, assisted by all the inventions of this mighty age of Iron.

*The Tritubercular Type of Superior Molar Tooth.*—Prof. COPE made some observations on the trituberculate type of superior molar tooth among the mammalia. He remarked that it is now apparent that the type of superior molar tooth which predominated during the Pueroo epoch was triangular: that is, with two external, and one internal tubercles. Thus of forty-one species of Mammalia of which the superior molars are known, all but four have three tubercles of the crown, though of these thirty-seven triangular ones, those of three species of *Periptychus* have a small supplementary lobe on each side of the median principal inner tubercle.

This fact is important as indicating the mode of development of the various types of superior molar teeth, on which we have not heretofore had clear light. In the first place, this type of molar exists to-day only in the insectivorous and carnivorous Marsupialia; in the Insectivora, and the tubercular molars of such Carnivora as possess them (excepting the plantigrades). In the Ungulates the only later forms of it in the Eocene are to be found in the molars of the *Coryphodontidae* of the Wasatch, and *Dinocerata* of the Bridger Eocenes. In later epochs it is chiefly seen only in the last superior molar.

It is also evident that the quadritubercular molar is derived from the tritubercular by the addition of a lobe of the inner part of a cingulum of the posterior base of the crown. Transitional states are seen in some of the *Periptychida* (*Anisonchus*) and in the sectorials of the *Procyonida*.

*The Spinal Chord of Batrachia and Reptilia.*—Dr. HARRISON ALLEN called attention to the characters furnished by the spinal chord in the systematic study of batrachians and reptiles. In making a resumé of the researches of Stieda Lüderitz, S. H. Gage and J. J. Mason he had formulated the following structural features which may be added to those characters already employed by systematists. In batrachians, as illustrated in *Rana*, *Melopoma* and *Siren* the connective is seen about the central canal to be of unusual development, and in *Siren* to embrace the entire chord in a conspicuous cortical layer. In addition to these features, connective-tissue corpuscles are sparsely distributed